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Title:

Assessing transmission and translation of learning about evidence based policing by graduate trainee police officers

Note: this is the pre-publication version and may contain minor errors or typos.

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Policing, pp. 1–16

doi:10.1093/police/pay072

Key words: Evidence Based Policing; Knowledge transfer; graduate police officers

Abstract:

We examine transmission of Evidence Based Policing (EBP) principles through taught classroom sessions, a skills based Masterclass and enhanced infusion experienced by participants of the Police Now (PN) leadership development programme. We coded seventy-five presentations describing a live project delivered by 57 PN participants (probationer constables) at one of PN's '100 Day Impact Events'. Benchmarking the content against extended EBP criteria revealed that graduates attempted to specify issues and engage in consultation, but made relatively limited use of concepts and theory, data analysis or statistical techniques. Rather than note this as a limitation of the PN programme, or 'failures' by the learners we argue that the findings open a wider discussion of what level of research sophistication can reasonably be expected of serving officers.

Introduction

How police officers should be trained and the level of education needed to deliver law enforcing and protective services to the public continues to be a matter of discussion, public scrutiny as well as ongoing policy and practice changes in various countries including the United Kingdom (HMIC, 2002; Wimshurst and Ransley, 2007; Heslop, 2011; Stanislas, 2014; Christopher, 2015; Huey, 2018). A watershed review (Neyroud, 2012) recommended the establishment of a new professional qualification framework with Evidence-Based Policing (EBP) as a core principle. In the wake of this the UK College of Policing, established in 2014, created three new routes into policing at Constable rank: an apprenticeship degree, a pre-join degree in professional policing, and the Degree Holder Entry Programme, all underpinned by EBP. Taking a focus on the transmission of EBP and its application in practice we briefly examine the somewhat protracted precursor attempts to uplift the quality of UK policing leading into a discussion of EBP translation into practice. This frames the analysis of recent data collected from a graduate leadership policing programme to inform a reasoned discussion of what level of sophistication in research methods that can be expected of frontline police officers. Is an evidence informed mind-set ‘good enough’?

Problem Orientated to Evidence-Based Policing

From the inception of the Metropolitan Police in 1829 to the 1970s, training of UK police officers concentrated on learning law and procedures by rote and informal on the job training (Hallenberg, 2016). This traditional model of policing relied on adherence to standard operating procedures, random preventative patrol and reactive response to calls for service (Veigas and Lum, 2013) without any formal qualifications required (Bryant et

al., 2014). Post 1970, attempts to introduce more systematic methods and higher level cognitive skills included the problem oriented policing approach (POP, Goldstein, 2003) and intelligence-led policing (Ratcliffe, 2002), which share common principles of focusing on ‘how’ policing is undertaken rather than merely articulating ‘what’ has been learned. These previous ventures are generally thought to have foundered for various reasons not least because of the inadequacy of police training (Bradford and Pynes, 1999; Scott, 2003) for facilitating such fundamental shifts in skills and thinking; and the truncated nature of the approaches actually implemented (Sparrow, 2016).

Sherman (1998) articulated EBP as a means to establish what works and on-going assessment as to what an intervention actually achieved. Sherman acknowledged his debt to Goldstein’s POP through the shared fundamental premise: that police practices should be based on scientific evidence of what works best together with evaluative and knowledge building components. Sherman’s innovation was to model EBP on medicine as an exemplar profession providing rigorous scientific evidence through sophisticated methods particularly Randomised Control Trials (RCTs), the highest level of reliability and validity on the Maryland Scientific Scale representing the ‘gold standard’ in research design. EBP has since taken on momentum as a worldwide movement (Telep and Somers, 2017) and is clearly influenced by medical notions of what constitutes ‘good evidence’ although evidence-based medicine itself is not without critics (e.g. Mykhalovsky and Weir, 2004). Sherman and colleagues based at the Institute of Criminology, Cambridge together with those from the Centre for Evidence-based Crime Policy at George Mason University (Lum and Koper, 2017) and the crime science academics at the Jill Dando Institute at University College London (UCL) (Smith and Tilley 2005) have done much to develop EBP. The What Works Centre for Crime Reduction (WWCCR) was launched in

September 2013, led by a team from the College of Policing with input and support from an Academic Consortium jointly funded by the College and the Economic and Social Research Council. This is a vehicle for the transmission of studies in crime prevention (Johnson, Tilley and Bowers, 2015).

Much of the EBP research lodged in WWCCR (and other data warehouses such as Evidence-Based Policing Matrix, (Lum, Koper and Telep 2011) and the Global Policing Database (see www.gpd.uq.edu.au) is academically derived. This raises the question of provenance posed by Neyroud and Weisburd (2014) who argue that science in policing is primarily ‘owned’ by scholars and instead there should be a degree of co-ownership with officers knowing about scientific methods. Goldstein (2003:18) previously agreed that problem solving should be a joint effort between police and social scientists since whilst the work of officers should be encouraged “we cannot depend so heavily on those efforts to produce benefits held out for the original concept [of POP].” Sherman (2015:10;16) cautions that attempts by officers to produce research without full acquaintance with academic standards may prove counterproductive; although he does see a role for the “evidence cop” as a kind of evidence reviewer to identify practice gaps in EBP. Lum and Koper (2017) propose a research-based practitioner model where officers learn about and keep abreast of research to apply in their everyday practice. An enhanced version of this is the presence of the ‘pracademic’ inside police departments- in other words those with academic training acting as ‘scholars-in-residence” which offers ways of police doing their own research and enhancing research partnerships (Braga, 2016:310; Huey and Mitchell 2016). Laycock (2014) concluded that the presence of police with doctorates carrying out research is the exception rather than the rule. Instead, Tilley and Laycock (2014) propose a hierarchical model in which local

problems are tackled by operational officers whilst greater levels of research sophistication are progressively adopted at force, national and international levels.

Transmission and translation of EBP

Regarding the receptivity to EBP, Lum et al (2012) conducted a study in the Sacramento Police Department before an in-service training course on crime analysis. About three-quarters of the officers had not heard of the term EBP, or of the major academic journals reporting police research indicating an overall lack of awareness. Telep and Somers (2017) also tackled the issue of practitioner knowledge of EBP by analysing survey data with police officers from the United States asking “how would you define the term evidence-based policing?” They developed a coding frame to analyse the given definitions (adapted for the present study). Reference to statistical data, what works, and being guided by previous research were the three staple elements in officers’ definitions.

Knowledge does not equate to application however. Regarding utilisation, an evaluation of the WWCCR (Hunter, May and Hough, 2017) reports movement in the direction of EBP principles percolating, albeit slowly, through the UK Police Service. This survey and qualitative interviews with police officers found greater involvement in research by police officers and staff, more examples provided of research informed decisions and greater dissemination of research evidence to operational staff via intranet space for promoting research and the products of the WWCCR compared to an earlier survey. Lumsden and Goode (2016) conducted 15 semi-structured interviews in three English police forces with officers and staff who conducted their own in-house research. They report use of methods which did not fit the hierarchy of evidence codified by the

Maryland Scale. Furthermore, officers lacked the necessary skills to set clear objectives, evaluate their interventions or critically appraise evidence. “Hotspots” were typically used synonymously with EBP. Their criterion for effectiveness consisted of demonstrations that community members “felt better” after an intervention elicited from their comments at community meetings.

Cherney et al (2018) when evaluating the understanding and use of EBP by senior staff in the Queensland Police Service compared responses between those who had or had not attended an EBP workshop. No significant differences were found regarding the importance of research methods; perceived usefulness of internal or academic research; or types of information sources regarded as important. Workshop attendees were more willing to use data before they implemented police tactics and compare with data after the tactic was up and running and undertook online research to try and find out what others have done. A bespoke EBP workshop designed by Fleming and Wingrove, (2017) revealed a modest (but statistically significant) reduction in enthusiasm towards EBP after the workshop attributable to beliefs about the lack of positive support from their force in implementing EBP initiatives. Unfortunately, these researchers were unable to follow up their workshop participants in order to determine what learning was activated in the workshop and whether applied in the work setting. These findings suggest that the workshop method of knowledge transfer may have limitations due to its confined nature. Stichler et al (2011) draw attention to the importance of diffusion of knowledge and the criticality of incorporating EBP content across student learning experiences and assignments.

What is currently missing is a wider reaching discussion of pedagogy and andragogy about how reflective learning and lasting changes in attitude, skill and motivation to gain knowledge about and apply evidence can be facilitated, not least as it could be expected that graduate officers may bring a level of transferrable critical thinking skills. Previous research on how EBP can be ‘taught’ is somewhat ambiguous and merits further investigation utilising data which may provide inferences about transmission to practice.

Aims of the current study

The objective of the current paper is to investigate whether, and if so how, EBP, can be inculcated through formal and largely traditional educational input and transmitted into practice. Using a critical and purposive sample of graduates undergoing policing leadership training we investigated how different types of EBP input manifested themselves in outputs summarising work-based learning – presentations of ‘impact’ topics and projects. More specifically, the research questions were:

- 1) Which topics do participants tackle to address EBP principles?
- 2) Does targeted EBP input through formal classroom delivery make a difference to knowledge transfer?
- 3) Does inculcation through infusion of EBP into classroom delivery add to knowledge transfer?
- 4) What role does a follow-up Masterclass play in knowledge transfer?
- 5) What level of knowledge and transfer thereof do graduates reach with respect to EBP?

The focus is the individual graduate officer as an adult learner, and potential agent of change rather than the institutional infrastructure required to embed EBP organisationally.

The Police Now Graduate Leadership Development Programme

The setting for the study is the Police Now Graduate Leadership Development Programme (PN) which aims to bring graduates into frontline policing (Yesberg, Fenn and Dawson, 2016) as probationer constables. The two-year programme focuses on training and developing recruits' leadership and problem-solving skills. It encompasses a pre-join, on-line introductory course; an intensive six-week Summer Academy (mixture of classroom, field and scenario-based learning); in-force induction and training, ongoing development seminars, coaching and mentoring, skills sessions (including an EBP Masterclass). PN participants take part in a series of field-based training shifts throughout the academy, followed by a 28-day immersion period in their force accompanying experienced uniformed officers on the policing frontline. The first cohort of PN participants joined the Metropolitan Police Service (MPS) in July 2015. In 2016, the programme was expanded to work with six other police forces across the UK in addition to the MPS. Since then a further 13 forces have partnered with PN so that just under half of the country's police forces are involved.

Police Now EBP input

The initial EBP input consists of a three-hour classroom session during the Summer Academy, delivered by subject matter experts from the College of Policing to establish its grounding principles and introduce key tools and techniques, including Scanning Analysis Response Assessment (SARA) and the Problem Analysis Triangle (PAT). Additional to this for Cohort Three (who commenced the programme in 2017), PN made a concerted effort to ‘infuse’ EBP in other classroom inputs by ‘buddying’ the police classroom lead with an academic discipline (e.g. Stanko on Domestic Violence). The academic ‘buddy’ provided briefing materials for the PN tutor to incorporate into their relevant teaching sessions during the Summer Academy. Cohorts Two and Three also attended an ‘EBP Masterclass’ comprising lectures and interactive ‘problem-focused’ panels delivered by academic and police EBP practitioners. The Masterclass (or skills workshop) built on the objectives of the Summer Academy input by extending participants knowledge of the key principles of EBP; elevating awareness of the conduits and barriers when utilising EBP; encouraging data-led approaches to identify key community issues; embedding knowledge of appropriate solutions, frameworks, toolkits to help address community concerns; and enabling officers to better measure and evaluate the impact of their work. The practical and interactive design of the workshop is leveraged around a diverse set of ‘real-life’ practical examples of research carried out by academics and police practitioners (as well as existing PN participants) currently engaged in EBP. Having undertaken a community intervention, participants gave presentations at one of PN’s ‘100 Day Impact Events’. As well as being asked to describe how they identified the problem and implemented an appropriate response they were asked to comment on any barriers they

faced and how they worked in partnership with internal and external colleagues/stakeholders and off a reflection on the experience.

Method

The Sample

The PN participants had been informed that an on-going evaluation of the programme was taking place and written consent to partake in the research activities was obtained on the first day of each summer academy. Participants were given the right to opt out and assured that all information would be anonymised in any data analyses and practitioner or research publications. A favourable ethical opinion had been granted at the researcher's home institution. Seventy five presentations were viewed and coded from 57 participants: 18 from Cohort Two (who only received the classroom input); this original 18 plus a further 21 (total 39) from Cohort two who had received the classroom input and Masterclass; and 18 from Cohort three who has received classroom, Masterclass and infusion We recognise that this is a relatively small sample thus we caution over interpretation or generalisability of the findings. For sample details see table one.

Table one about here

The graduate officers came from a range of universities including six Oxbridge graduates and 19 from other Russell group institutions (these are the 24 more research intensive universities in the UK). Degrees varied with about a third studying Humanities subjects (such as languages, philosophy, English) and a third graduated in Social Sciences (e.g.

Psychology, Sociology or Criminology). Ten (17.5%) had Law degrees and the remaining 16% had degrees in a STEM subject (e.g. Biochemistry, Maths or biological sciences). About half had had some prior paid employment (ranging from teaching, public sector or hospitality industry). Just under half were women and all mostly from white British backgrounds. They were on average 24 years of age (range 21-29 years). There were no statistically significant differences between the samples other than the officers in Cohort Two were slightly older (average age 24.5) than Cohort three (22.3 years $-t = -4.2$ $p < .001$).

The impact presentations and the level of EBP input across cohorts

PN participants were required to present the results of a ward/area-based initiative they had undertaken once back in their respective forces at one of Police Now's 100-Day Impact Events. PN participants were given 15 minutes slots for an oral presentation, twice across two years. Other forms of assessments included submission of posters, videos and/or blogs. As well as demonstrating EBP in practice, they were asked to reflect on lessons learnt and what they might do differently in the future. The presentations were video-taped and lodged in Police Now's Impact Library.¹ Of the, 75 presentations 20 were viewed and analysed by a researcher present during the Impact Day presentations and 55 by (a different) researcher viewing the videos. To start, eighteen first impact presentations (put together about six months into the programme) were coded from Cohort Two who had only received the basic three-hour classroom input. In 2018 all Cohort Two attended the day long day master-class session and the subsequent second presentations made by the original 18 PN participants plus a further

¹ Police Now's Impact Library is a collection of approximately 1,000 presentations, videos, posters and 'how to' guides delivered by Police Now participants and other police practitioners. This can be accessed by police officers across the UK to apply learning to practice.

21 second presentations (i.e. a total of 39 members of Cohort two having both classroom input plus the Masterclass session) were coded. Finally 18 presentations were coded from PN participants from Cohort Three, who had a three hour classroom input and also attended the Masterclass but also experienced their Summer Academy classroom sessions more deliberately infused with evidence based academic references as described above (i.e. classroom input+master-class+EBP infused sessions).

Coding Procedure

The presentations were coded as present or absent according to seven definitional criteria adapted from Telep and Somers (2017) into behavioural indicators summarised in Table two. These overlap with but offer a more refined coding than Sherman's targeting, testing and tracking criteria adapted by Huey et al. (2017) in their study. As indicated in the table some further adaptations were made to the codes.

Table two about here

Observations by one researchers assessing 20 presentations in situ noted it was evident that only some presentations sufficiently addressed the feasibility of their intervention or the means to evaluate sustainable solutions or attempted to elicit root causes, instead focusing purely on symptoms. Therefore, two additional categories were added; resources to reflect longer term effectiveness of the intervention and understanding to indicate any appreciation of contextual factors.

Inter-rater reliability checks and coding calibration

Ten (13.3%) presentations were selected at random to undertake a comparative coding between two members of the research team. This achieved an initial overall inter-rater reliability of 81%. Yet we found that, as Nutley et al (2007:45) also report, applying a priori research generated categories proved more challenging than initially expected. The boundaries between the categories were blurred, the categories were not mutually exclusive and identification in use was problematic as the presentations were short on detail. Most problematic was the Statistics category which only attained a 50% inter-rater agreement partly because none of the graduates used any form of tests of statistical significance and one coder applied this category more stringently. Based on these observations, the code definition was changed to Data. This was then coded as present if the PN graduate utilised numerical data to help focus their problem and in assessing outcomes. The Resources category as first defined received a 70% agreement of coding and overlapped somewhat with the Preventative category. The former was adjusted and re-defined as appropriate use of negotiation for resourcing longer term preventative efforts such as charitable trust funding or inter-agency involvement or the seeking of civil injunctions to ameliorate the problem. Finally the Telep and Somers Evaluation criterion was doubled barrelled in that it specified awareness *and* conduct, so this was split into evaluation(a) meaning the importance of evaluation was acknowledge even if the graduate did not subsequently carry one out either because they ran out of time or in a few instances the project as designed was aborted, and evaluation (b) meaning that the graduate carried out some form of evaluation (often by comparing before and after incident log data). A second inter-rater reliability was conducted on the redefined codes achieving concordance in 88% of ratings with no category falling below 80%. The re-calibrated coding scheme was then applied to the whole data set. As well as coding the

presentations against the criteria, the actual topic was noted and recorded. A fuller account of this procedure can be found in McDowall et al (2018).

Results

Topic

Addressing the first research question (choice of topics), more often than not the PN participants had been tasked by their sergeant to consider a particular issue. They drew on a range of evidence to assess and scope the issue further including but not limited to force statistics on crime, call-outs and complaints, but also local authority data. They further sought input from colleagues, line managers and sometimes other forces. The issue was highlighted by force-wide statistics, email traffic, stops during patrolling or surfaced during ward/area meetings. The two most frequent issues tackled were anti-social behaviour (N=19) and drug related problems (N=16) as shown in figure one. Thereafter there was considerable variety but it was striking that all issues were highly localised and specific, often limited to one street, a particular premise or even a single individual (a vulnerable person or persistent offender).

Figure one about here

Use of EBP principles

Overall the PN participants detailed highly focussed interventions. However, this was largely due to the localised specificity of their issue. Over half (53%) used data to help identify issues to refine the target such as identifying a specific house that was being

used by dealers to distribute drugs, or being alerted to a particular homeless person with drink issues causing nuisance to a neighbourhood. SARA and the PAT were the most frequently mentioned tools used to frame the problem. Over three quarters demonstrated awareness that some form of evaluation should take place. Additionally, they made various attempts to try and understand and conceptualise the problem. Most presented an outline sketch of their local area by way of demographics and indication of relative deprivation. Local surveys and analysis of email traffic revealed public concerns. Several who tackled vulnerable victims or prolific offenders indicated an awareness of mental health problems and made efforts to alert relevant agencies. They also showed some appreciation of the need for prevention as well as solution to the immediate problem. The graduates showed considerable resourcefulness in engaging other agencies such as local partners, charities, housing or social services departments in effecting longer term preventative measures and sustainable solutions such as re-housing street drinkers or gaining financial support from local businesses to construct alley gates.

The presentations included little indication of seeking or using any explanatory concepts that underpinned the problem they were looking at, were not likely to use previous findings to design their intervention or apply any tests of statistical significance to determine their efficacy. Where What Works research was consulted, hot spots research was the most frequently cited.

Addressing the second research question (does classroom-based input have an impact on knowledge transmission) and fourth question (the role of the Masterclass) using only Cohort Two data, we compared presentations by the eighteen participants who had just experienced the three hour EBP classroom input with their subsequent presentations

after they had also attended the Masterclass (see table three). Attendance at the Masterclass appeared to have enhanced their willingness to search for What Works research. This included consulting the CoP's WWCCR data base and also locating previously successful initiatives from other forces. These included use of alley gates, high visibility patrolling, and needle exchange schemes. There was also an increased awareness of the need to evaluate and design interventions based on previous research. There were modest, but statistically non-significant, improvements across the other EBP criteria. This may well indicate some learning and perhaps with a larger sample, these results would be amplified.

Table three about here

In considering the infusion element (research question 3) a comparison was undertaken between Cohort Two (having had only the classroom input) with the same individuals who had additionally attended the Masterclass, with Cohort three members who had also received the Summer Academy sessions infused with EBP input. These comparisons are presented in table four. There were no statistically significant differences on any EBP indicators between Cohort Two participants once they had attended the Masterclass and Cohort Three participants who additionally had been exposed to the EBP infused sessions. From this we concluded there was some but limited added value from the infused EBP sessions, although a larger sample may have teased out greater differentiation. There was some indication that the project was more likely to be designed by reference to a previous study and a greater effort was made to appreciate underlying causes. There were statistically significant differences between Cohort Two (classroom input only) and between Cohorts Two and Three having

attended the Masterclass demonstrating an uplift in consulting the what works literature, appreciating the need for evaluation, using insights from research to design the intervention, and taking a more scientific approach. There were no differences regarding PN participants engaging in attempts to understand the problem or using additional resources for sustainable impacts after the intervention.

Table four about here

The average number of EBP principles used doubled after PN graduates had attended the Masterclass, but there was no appreciable improvement with the additional infusion input.

Post hoc analysis revealed that the graduate's force, subject or class of degree and whether attending a Russell group or non-Russell Group University did not make a statistically significant difference in either the overall number of behaviours exhibited or in the types of EBP principles used.

Discussion

Our overall objective was to generate data on how the teaching of EBP works for PN participants in practice, with specific consideration of different types of input and inculcation. Regarding the first and last research questions (topics were approached and the level of knowledge displayed) our findings indicate that the PN officers approached their ward problems with enthusiasm and forethought and identified a wide range of

potential issues. Some showed considerable initiative and ingenuity in gaining resources from charities or partner agencies when trying to sustain the solutions to their problem. Also encouraging was that the use in practice of the concepts identified by Telep and Somers (2017) appeared greater than the apparent understanding exhibited by their US sample pool when simply defining EBP.

Most PN participants attempted to describe the population demographics, environment and relative affluence or deprivation of their areas to contextualise the problem. Although the problem was often very circumscribed by its localised nature, the graduates did attempt further focusing by using SARA and the crime triangle.

Regarding the level of EBP apparent in the impact presentations, these were analogous to those found for POP projects by Read and Tilley's (2000), in other words localised and confined. With respect to the POP projects, whilst reporting some good practice (often in conjunction with academia) many projects were at the level of basic problem-solving dealing with small scale highly localised problems thus truncating what was originally envisaged (Leigh, Read and Tilley, 1997; Read and Tilley, 2000). Similar to Lumsden and Goode's (2016) prior findings, the PN projects showed little evidence of utilising theoretical ideas to get at root causes, although there was more effort made to try and at least understand contributory factors by PN participants receiving all three types of EBP input. Most of the presentations described were problem focused rather than innovation led interventions. Where an assessment of the impact was conducted all but one PN participant used a before and after comparison (the lowest level of evaluation rigour on the Maryland scale) and none use any tests of statistical significance. Often anecdotal evidence was used to measure impact such as a diminution of email traffic complaining

about the problem, comments to the officer whilst on patrol or at public meetings as found by the projects Lumsden (2016) evaluated. Their use of SARA and the PAT were largely atheoretical. With regard to their use in POP, Ekblom (2003) is particularly critical of both SARA and the PAT as being overly simplistic, too narrow and limiting. Rather than fostering expertise, Ekblom suggests SARA and PAT whilst being accessible and easily grasped, miss the inherent complexity and underlying causal mechanism needed when addressing problems. PAT was conceived as a framework derived from Routine Activity Theory and is theoretically complex (Eck, 2003) yet is often applied without reference to its conceptual origins. Ekblom (2003) argued that without causal explanations for why a problem arises or how an intervention works can result in superficial and “cookbook” implementation of POP. Most of the understanding exhibited by PN participants was in the form of describing the population of their policing area (quite a few being in socio-economically deprived neighbourhoods). Their use of SARA corresponded to Layock’s (2014) observation that most of that evidence informs the scanning and analysis elements of SARA, rather than the response and assessment stages. The limited evidence of practice and theoretical integration was similar to Ratcliffe’s (2002) criticism of the implementation of ILP. As far as could be determined, there were no formal write ups of the interventions.

Regarding the different input types (the second, third and fourth research question about the respective effectiveness of different modes of teaching for knowledge transfer), the classroom input alone resulted in some awareness about trying to understand the problem and build in a preventative element, but greater uplift was achieved by attendance at the Masterclass. The infused classroom session appeared not to result in significant learning uplift although there was a modest trend towards greater understanding of the problem at

hand. One potential explanation for the efficacy of the Masterclass is that it offered additional opportunities for interaction and active learning, through a reinforcing and iterative mechanism. The Masterclass with its combination of presentations by experts, breakout sessions and Q and A panel resulted in greatest uplift of learning compared to the solo classroom session. It is likely that exposure to EBP principles in that session helped reinforce learning in the Masterclass. SARA and PAT were taught as tools rather than theoretically integrated research methods with all the limitations identified by Ekblom, (2003). The attempt to infuse EBP in other Summer Academy sessions did not appear to result in significant gains. Coomarasamy and Khan (2004) found that didactic stand-alone classroom teaching whilst improving knowledge about EBP in medical students did not enhance skills, attitudes or behaviour. Rather it was when theory and practice teaching were integrated that re-enforced learning showed the greatest behavioural change. The PN Masterclass participants were building on terms and concepts they had been exposed to in the previous classroom input thereby achieving the re-enforcement as suggested by Stichler et al (2011). They were also given the opportunity to discuss their forthcoming projects in smaller groups and pose questions to an expert panel. These observations reinforce the notion that transfer of EBP into practice is contingent not just on the quality and scope of the actual material transmitted, but also the opportunity to discuss, reflect and make the link to practice.

As an additional observation, the type of degree did not appear to make any difference in acquisition of EBP principles. This is consistent with US research reported by Paterson (2011) who found it was not so much a particular course that made the difference when comparing graduate with non-graduate officers, but rather their overall university experience. The inference here is that the skills attached to “graduateness”, in other words

transferable skills on managing tasks, solving problems, and working with others communication and self-awareness (Glover, Law and Youngman, 2002), may be utilised rather than specifics of EBP teaching. The teaching seemed rather to be at the level of training focusing on transmitting knowledge to accomplish a specific task, in other words “single loop” learning rather than education in which knowledge is assimilated and developed leading to “double loop” learning. In short, double loop learning involves more than reproducing by rote but also includes monitoring the effectiveness of actions and tests of new knowledge against what was originally learnt (Argyris, Putman and Smith, 1985). Double loop learning contributes to reflective practice by facilitating the integration of theory and practice and encourages correction through evaluation.

That said, the PN participants did make a concerted effort to scope and refine the problem in hand and also made efforts to consult with others to formulate solutions; and were more likely to do so once they had experienced EBP input in the form of taught input and interactive Masterclasses. They were also more aware of other resources available yet may not have had the time to draw on these in practice as they undertook the projects alongside regular duties. What our analysis indicates is that education on EBP does sow the seeds of an inquisitive and evidence-informed problem-solving approach, but that the resources (including time allocated and research support) may limit what can be achieved in practice.

Yet, rather than focus on critique of the limited scope of the teaching and application of EBP by the PN participants, it takes time to develop new ways of working, our analysis raises a fundamental question about what level of research we can realistically ask officers to undertake alongside operational duties. Whilst it might be too much to expect police officers to conduct randomised controlled trials whilst juggling multiple duties (this is a

complex research design, requiring detailed protocols which test even experienced researchers), it may be more realistic to aspire to expect an evidence informed problem solving mind-set which questions data and stereotypic assumption about cause and effect. The PN participants had been briefed to address the innovative value and their resilience in accomplishing their project as well as describing any consultation with affected individuals. This was a rather wider remit demonstrating ‘impact’ than just expounding EBP principles in the limited time of their presentations. Therefore, it is arguably unsurprising that they did not necessarily spell out in detail the design their interventions or how this may have been derived from the what works literature, or explain how they formulated hypotheses, or explicitly considered the ethical dimensions of collecting data on people. The fifteen-minute time slot limited what they chose to emphasise in their presentations.

Conclusion

Our main conclusion is that EBP teaching inputs resulted in a measure of enhancement and application indicating some consolidation of knowledge of the principles of EBP, greater use of data-led approaches to identify key issues through use of analytical tools and increased awareness of the need to evaluate. The Masterclass with its combination of presentations by experts, breakout sessions and Q and A panels resulted in greatest uplift of learning suggesting a need to revisit the teaching methods to inculcate EBP principles and more specifically enhance the practice element in the interactive skills based master-class to consolidate basic classroom teaching. There are clear implications here for pedagogy and andragogy to ensure active learning and transfer of knowledge through a continuous cycle of reflection and double loop learning. We propose that regarding the

programme providing the data analysed here, potentially valuable next steps for PN are to consider how the presentations themselves can be exploited to share feedback and widen learning for areas to improve and to elevate standards of evidence. The videoed presentations could be incorporated as an opportunity for self-reflection, as well as peer feedback, to provide an additional component to the Masterclasses.

Regarding the range and breadth of EBP knowledge demonstrated we also found little evidence of full attempts to draw on a range of data, ground outputs conceptually and theoretically, or conduct tests of statistical significance. The work PN participants undertook was certainly not without merit but limited in scope and clearly constrained by organisational influences. So rather like Goldstein's (2003) conclusion for POP, EBP as practiced by the PN participants was in a diluted form. This leads our discussion to the question asked by Laycock (2014:396): "Do we expect the police to act as experimental criminologists themselves and design a research strategy, decide the sampling frame, consider appropriate statistics, write up the research results and publish them?"

Responding to this question, there are emerging critiques of a narrowly defined EBP (Sparrow 2016; Brown et al, 2018). Police officers often do not have the luxury of waiting for the results of a randomised control trial but do have access to experiential knowledge that may contribute to problem definition and solutions (Fleming and Rhodes, 2018). Increasingly other professions such as social work are moving to a model of practice informed but not exclusively led by evidence (Nevo and Slonim-Nevo, 2011). They suggest practitioners need to be knowledgeable about research findings that enriches but does not limit their practice. This leave space for the use of discretion and experience (Fleming and Rhodes, 2018), the imagination advocated by Goldstein (2003) and also introduces a level of accountability for choice of intervention. In the Tilley and Laycock

(2014) hierarchical formulation, the bulk of regular crime and disorder that operational policing comes into contact with is in the context of communities' daily lives. We suggest at this level there is a need for a more routinized evidence informed practitioner armed with basic knowledge of where to find relevant research, how to apply and integrate with other resources together with the tools to engage in some basic evaluation. This may be 'good enough' to sustain an evidence-informed perspective at the grass roots level for day to day operations, leaving force or policy level research, including programme evaluations, to the 'pracademic' or police-academic collaborations. A key learning from our research is that EBP has to be explicitly marketed as such in any training and education to transmit principles into practice, and that any evaluations should go beyond simple perceptions of EBP as a version of SARA and PAT but be tailored to appropriate levels required of the problem to be solved. Future evaluations could adapt and build on our framework to allow continuous investigation of the use of high level macro evidence (do people know where to find EBP publications), but also transmission to local practice (micro-level) , to then feed into best practice in training and education (meso-level).

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Table One: Sample details

Details	N	%
University		
Russell Group	25	43.9%
Other	32	56.1%
Degree subject		
Law	10	17.5%
Humanities	18	31.6%
Social Science	20	35.1%
STEM	9	15.8%
Degree Class*		
First	21	36.8%
Upper second	35	64.1%
Previous paid employment		
Yes	26	45.6%
No	31	54.4%
Force		
Metropolitan Police Service (MPS)	22	29%
Lancashire	11	19%
West Midlands	6	10.5%
Thames Valley	6	10.5%
Bedfordshire	6	10.5%
Cheshire	2	3.5%
Surrey	2	3.5%
Northamptonshire	2	3.5%
Gender		
Female	26	45.6%
Male	31	54.4%
Ethnicity		
White British	45	78.9%
Mixed heritage	3	5.2%
Asian British	3	5.2%
Other white	2	3.5%
African British	2	3.5%
Prefer not to say	3	5.2%
Average age	23.8years	
Classroom only condition		
Cohort 2	18	
Classroom+Masterclass condition		
Cohort 2	39 (original	
Classroom+Masterclass+infusion	18+21)	
Cohort 3	18	

*One graduate was recorded as having a lower second

Table Two: Coding Framework developed from Telep and Somers (2017)

Category	Behavioural Definition	Changes applied during coding process
What works	EBP emphasises interventions that ‘work’. This category included indication of accessing and reviewing previous published research of effective best practice (e.g. consulting the College of Policing What Works data base)	Added to the code was identification of a relevant theory or concept
Focus¹	Highlighting the benefits of focussed interventions and specific problem analysis and making efforts to utilise previous data (e.g. accessing force statistics) or employing some systematic method (such as SARA or the Problem Analysis triangle) for focusing the respective enquiry	
Evaluation¹	Undertaking of some systematic measurement of outcomes and awareness that interventions require ongoing evaluation and analysis	This code was split into evaluation (a) = importance of evaluation was acknowledged and evaluation (b) = graduate carried out some form of evaluation
Research¹	Indication that EBP interventions and strategies were designed with reference to prior reliable research/empirical evidence and studies.	
Scientific¹	Building on the above, indication that strategies were informed by scientific research, rather than case-based, or less formal before-after type comparisons	
Preventative¹	Use of proactive strategies, rather than response-only strategies (including efforts to engage other parties post intervention to sustain the initiative)	
Statistics¹	Utilisation of data and statistics, in contrast to anecdotal evidence (including some measure of before and after statistical comparisons)	This code changed to Data : utilisation of data to support argument and claims made to better reflect the usage in the presentations
Resources	Shows awareness of the need for EBP interventions to be efficient, as well as effective and have a sustainable dimension, and reflecting Sherman’s tracking criteria	Added during initial coding ; definition refined to: appropriate use of negotiation for resourcing longer term preventative efforts such as charitable trust funding or inter-agency involvement or the seeking of civil injunctions to ameliorate the problem
Understanding	Some effort made to contextualise the problem and understand the underlying causes	Added during initial coding

¹ Definitional criteria from Telep and Somers’ (2017) coding framework.

Table three: Matched comparison of EBP criteria demonstrated by EBP input for Cohort 2 (N=18)

EBP criteria	Cohort 2 (N=18)	
	Classroom only EBP input	Classroom plus master class
Accessed what works research	11% (2)	67% (12)***
Focussed initiative	94% (17)	100% (18)
Indicated awareness of need for evaluation	39%(7)	78% (14)*
Conducted some evaluation	33% (6)	56% (10)
Design based on previous what works research	0	61% (11)***
Conducted intervention informed by prior research	0	22% (4)
Built in prevention	61% (11)	61% (11)
Use of data	39% (7)	67% (12)
Proactively engaged post intervention resources	50% (9)	33% (6)
Effort to understand underlying causes	44% (8)	61% (11)

Fisher's Exact Test*** p< .001 *p<.05

Table four: Comparisons of Cohorts Two and Three for EBP criteria by type of EBP input

EBP Criteria	Cohort 2		Cohort 3
	Classroom only EBP input (N=18)	Classroom plus master class (N=18+21=39)	Classroom plus masterclass plus classroom infusion (N=18)
Accessed what works research	11% (2)	64% (25)	50% (9)***
Focussed initiative	94% (17)	100% (39)	100% (18)
Indicated awareness if need for evaluation	39% (7)	78% (38)	72% (13)***
Conducted some evaluation	33% (6)	56% (22)	72% (13)
Design based on previous what works research	0	56% (22)	72% (13)***
Conducted intervention informed by prior research	0	28% (11)	28% (5)*
Built in prevention	61% (11)	56% (22)	72% (13)
Use of data	39% (7)	54% (21)	44% (8)
Proactively engaged post intervention resources	50% (9)	36% (14)	39% (7)
Effort to understand underlying causes	44% (8)	56% (22)	78% (14)
Average number of EBP behaviours exhibited	3.8	6.0	6.2 ANOVA F=7.9 p<.001)**

Chi-square ***p<.001 * p<.05

**Scheffe range test indicates statistical differences in average number of EBP behaviours between classroom only and classroom plus master class and between classroom only and class room plus master class plus infusion.